
How long does the concept of the Nyquist frequency hold?

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Abstract

In order to recover all Fourier components of equally spaced data, it is necessary to use a sampling interval between two consecutive measurements (Δt) at least twice the highest frequency. The Nyquist frequency just depends on the time distribution and is the upper limit that can be coded at a given sampling rate in order to be able to fully reconstruct the signal, i.e., $1/2 \Delta t$. The difficulties in defining the frequency range especially the upper limit occur if you have to handle unevenly spaced data with large gaps, which is the reality for ground based observation and also the case for the Satellite BRITE. The Satellite will provide a sampling rate of 1 - 60 sec and a minimum observing time of 15 min per 100 min satellite orbit. We probe what frequency range is possible for this satellite and how the Nyquist frequency can be verified in unevenly spaced data and what is the limit when the 'classical' definition of the Nyquist frequency breaks down.

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